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The Mission of Science and Education Administration -Agricultural Research

Foreword

This publication presents the mission and goals of the U.S. Department of Agriculture's Science and Education Administration (SEA) in-house research activity designated as "Agricultural Research" (SEA/AR). It also describes the special capabilities of SEA/AR for accomplishing the mission goals and the role and setting in which SEA/AR conducts its activities. The paper includes three sections:

- * The mission of SEA/AR.
- * SEA/AR's special capabilities to accomplish mission goals.
- * The role of SEA/AR in the Nation's food and agricultural system.

In the first section, the goals of SEA/AR are described in the context of congressional authorizations and mandates, Executive (Administration) guidelines, roles and contributions of State agricultural experiment stations, and the nature and extent of private-sector agricultural research activities.

The second section describes the special and unique capabilities of SEA/AR to accomplish its goals and meet objectives and responsibilities that are in the national interest. These include the provision of a centrally organized base of expertise capable of providing basic scientific knowledge in support of agricultural productivity; responding rapidly with a critical mass of multidisciplinary talent to broad national and regional problems and concerns; maintaining unique repositories and collections; and responding to needs of action and regulatory programs of USDA and other Federal Departments.

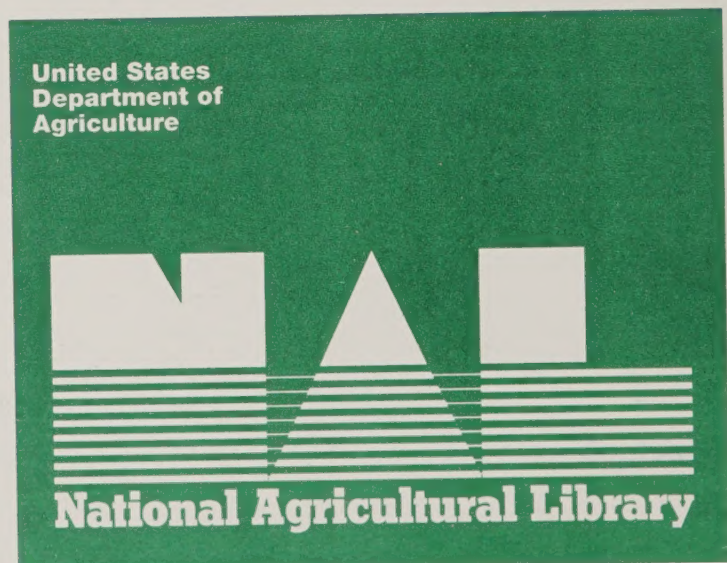
The third section provides a brief historical background, and a description of SEA/AR; its partnership with State agricultural experiment stations; and its perceived role and responsibility relative to that of private-sector (industrial) agricultural research. This section also includes a brief presentation of the future challenges and opportunities that AR expects to attack with a dynamic, flexible, and well-balanced organization soundly grounded in fundamental research.

In addition, there is supporting information pertaining to the organization and facilities of SEA/AR and a list of the principal statutes relating to Agricultural Research activities.

We are grateful and appreciative of the efforts of the special task force that worked so diligently to prepare background material for this document. The assistance and helpful suggestions of representatives of the State agricultural experiment stations are especially appreciated and have contributed greatly to the development of this mission statement.

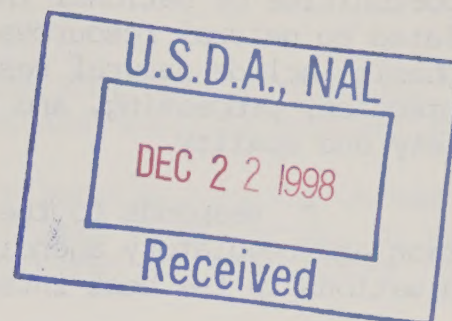


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The Mission of Science and Education Administration -Agricultural Research



American agriculture is providing the Nation with food and fiber supplies unequaled in history. At the same time, the American agricultural system is helping other nations to meet the food and fiber needs of their expanding populations. The United States is exporting more farm products than any other nation, and through food production technology it provides assistance to both the developing and the developed parts of the world.

The United States Department of Agriculture (USDA) is legislatively mandated to help provide the Nation with adequate supplies of high-quality food and fiber, biomass for fuels, and sufficient natural resources for use in agriculture. A forward-looking, Federally funded and managed agricultural research organization is essential to the continuing fulfillment of this mandate.

The Nation's food and agricultural research system is built around (1) the USDA Science and Education Administration's Agricultural Research Staff (SEA/AR), which focuses on agricultural problems of broad regional, national, and international concerns; (2) the State agricultural experiment stations, which focus on local and regional problems; and (3) the food and fiber industry, which generally performs proprietary applied research and development. Together, this tripartite system carries out the basic and applied research necessary to provide a dependable supply of high-quality food and fiber to consumers, to develop renewable resources for energy, and to maintain a quality environment through sound husbandry of natural resources. The partnership between SEA/AR and the State experiment stations together with their joint association with industry strengthens the mutual capability to assemble and focus scarce technical skills and resources on high-priority problems.

Within this pluralistic and unique agricultural research system, SEA/AR plays a distinctive and well-identified role. Specifically, SEA/AR—

- * Maintains and manages a nationwide, dynamic organization of scientists and research managers who (1) conduct research on new and changing problems and priorities without geographic or political constraints; (2) provide continuing technical and scientific information and guidance for key executive policy decisions, regulatory decisions, and legislative actions; and (3) look ahead to future research opportunities and potential scientific breakthroughs, which not only are challenging and exciting but also are of a potentially high degree of importance in meeting the Nation's future problems.

- * Maintains a corps of scientists recognized as national authorities in specific commodity, natural resource, and disciplinary fields. These scientists provide technical guidance and inspiration for ongoing research, serve as informal science advisors, and anticipate profitable and useful future research directions.

* Fulfills the diverse needs of agricultural users—from farmers to consumers—by focusing resources, facilities, and efforts on specified problems and opportunities of national interest, national security, and broad regional concern related to natural resources and the food, fiber, and energy chain. Areas of emphasis include natural resource conservation; crop and animal production, protection, processing, and distribution; and consumer-related problems, such as food safety and quality.

* Responds to the food- and agriculture-related research needs of Federal action and regulatory agencies, and when appropriate, conducts independent tests and evaluations in the best interests of the U.S. Government.

* Participates, as the Federal in-house research component of SEA, with other sectors of the agricultural research system in planning, coordinating, and executing high-priority national and regional research programs.

* Attacks problems important to the Nation that no one State or private group has the resources, facilities, need, or incentive to solve. In these cases, SEA/AR provides specific capabilities needed to complement and support research programs involving cooperators and partners.

* Works with the Science and Education Administration's Cooperative Research Staff (SEA/CR) in encouraging and facilitating cooperation and coordination of agricultural research conducted by the States, the land-grant colleges of 1890 and Tuskegee Institute, and the U.S. Department of Agriculture.

* Interacts with and responds to needs of Extension staffs by conducting research to solve special problems based on feedback supplied by Extension personnel.

* Provides support and training opportunities for agricultural higher education programs.

* Conducts research and development to meet international needs as determined by the policy of the U.S. Government and the now-recognized global nature of agriculture.

* Carries out research and development programs as required to fulfill the mandates of Congress, the President, and the Secretary of Agriculture.

SEA/AR's Special Capabilities to Accomplish Mission Goals

To accomplish its missions, SEA/AR--

- * Maintains and manages a research organization that ensures dynamic, timely, and flexible scientific responses to new problems and changing national goals.
- * Operates a network of more than 148 research locations in the United States and abroad. This network includes seven major national laboratories, of which five are regional research centers dedicated to the improvement and utilization of agricultural products.
- * Encourages and nourishes a scientific environment that fosters the development of creative, innovative technical expertise.

Capabilities necessary to accomplish SEA/AR missions include--

A Centrally Organized Base of Scientific and Agricultural Expertise--SEA/AR's national organization permits the quick formation and operation of teams to respond to research needs. Because they are funded from a central source, such teams can be assigned to priority research or analysis of problems without conflicting demands on time or responsibility. The familiarity of AR scientists with governmental programs, action/regulatory agency procedures, and local, regional, and national problems provides a unique perspective to agricultural research.

This national structure permits SEA/AR to (1) respond quickly and effectively to disasters and emergencies by bringing together the necessary expertise; (2) form with State agricultural experiment stations, collaborative, synergistic, Federal/State teams with complementary capabilities to research such special problems as moisture stress of plants, nitrogen fixation, photosynthesis, genetic engineering, integrated pest management, and water quality; and (3) organize and conduct, in support of action and regulatory agency programs, long-range research on national and regional problems, such as soil erosion, sedimentation, and environmental quality.

Unique Collections and Repositories--Unique collections and repositories of information and materials, developed and maintained by SEA/AR, meet national research needs. These collections are essential and are heavily utilized by other public and private research organizations. They include the National Seed Storage Laboratory and other facilities for plant germplasm introduction and preservation, the AR Culture Collection, and other microbial, insect and plant taxonomic collections, clonal repositories, and disease-free seed stock.

Critical Mass of Scientific Capabilities--The diversity of SEA/AR's scientific work force allows AR to assign critical masses of scientific talent to geographically broad and difficult problems not readily undertaken by State, private, or industrial institutions. Research teams can be established from SEA/AR's own scientific resources and used in coordination with resources of the State agricultural experiment stations and other institutions. These teams can attain the critical mass that is vital to the interaction and stimulation needed for scientists to generate new ideas and innovatively resolve complex problems.

Extensive Resources Specific to Research in Agriculture--Much of SEA/AR's resources of expertise and facilities complement and support other parts of the agricultural research system. Such AR facilities as the Beltsville Agricultural Research Center and the regional research centers are invaluable national resources and are recognized internationally as premier agricultural research establishments.

Specialized AR facilities exist for research on exotic diseases of animals and plants and on the insect vectors of such diseases. SEA/AR also holds extensive lands in the major ecosystems and has resources to implement long-term, high-cost,

high-risk research in such facilities as the U.S. Salinity Laboratory, Riverside, California; the Livestock and Range Research Station, Miles City, Montana; the Meat Animal Research Center, Clay Center, Nebraska; and the Plum Island Animal Disease Center, Plum Island, New York. Such research capabilities are not feasible for other research organizations to establish or maintain. The reservoir of information and experience at SEA/AR research centers is highly important to the continuity and progress of the total agricultural research system.

Coordination of Research--SEA/AR scientists provide peer leadership and coordination to such joint national programs as Regional Poultry Projects, the Regional Beef Research Project, Avian Leukosis System, and important national aspects of Integrated Pest Management. They also provide informal national and international leadership for many commodity and natural resource areas of research.

SEA/AR works with SEA/CR, its State cooperating institutions, and other Federal research fund-granting agencies to plan and support Federally-funded extramural research programs of highest priority to American agriculture.

Interagency Cooperation--SEA/AR scientists provide the expert technical advice called for by a broad range of USDA agencies including the Economics, Statistics, and Cooperatives Service; Soil Conservation Service; Forest Service; Animal and Plant Health Inspection Service; Food Safety and Quality Service; and Agricultural Marketing Service. They also respond to needs of Federal Departments and independent agencies including the Department of the Interior, Department of Commerce, Environmental Protection Agency, Department of Energy, Department of Health and Human Services, Department of Defense, and National Aeronautics and Space Administration. Conversely, within the Federal Executive Branch, SEA/AR draws on the expertise, facilities, and equipment of such agencies to augment its research programs.

Responsiveness to Federal Action and Regulatory Agencies--SEA/AR provides research and participates with Federal action and regulatory agencies in implementing their regulatory and programmatic responsibilities. The success of many regulatory activities is dependent on responding and redirecting research efforts on a timely basis. SEA/AR scientists in the field are assigned to special emergency response teams when called upon by an action/regulatory agency. The broad geographical placement of SEA/AR's scientists and the diversity of their scientific disciplines serve as an informal early warning network to alert them to potential public health problems, insect infestations, and disease outbreaks.

International Activities--The U.S. agricultural research system is also a component of the global research system. SEA/AR interacts with this system in the following ways:

- * SEA/AR laboratories in foreign countries evaluate and make recommendations on domestic programs pertaining to such areas as ensuring quality of export commodities and searching for parasites of imported pests, insect predators, and plant pathogens to control introduced weeds.

- * SEA/AR scientists recommend specific programs and advise and assist scientists in foreign countries who are working with Public Law 480 programs. An example of this assistance is the development of data bases on foreign pests that are potential invaders of U.S. cropping systems.

- * Special work groups are established for handling such international programs as fever tick, screwworm, genetic vulnerability, guayule, desertification, and tropical agriculture.

The Role of SEA/AR in the Nation's Food and Agricultural System

Background--Agriculture, among the major sectors of the U.S. economy, has the longest tradition of government-supported research. This tradition dates from the Organic Act of 1862, signed by President Lincoln, which established the Federal role in agricultural research by creating the U.S. Department of Agriculture, thus providing a means for the development of a science-based American agriculture. The Morrill Act of 1862 provided 11 million acres of public lands to the States to establish colleges that would teach and conduct studies in the agricultural and mechanical arts (the Land-Grant System). The Hatch Act of 1887 authorized the establishment of agricultural experiment stations in each State and provided for Federal funding of research at the State stations. The intent was to ensure that research would remain close to the needs of the people. In 1890, Congress passed the Second Morrill Act. Under its provisions, 17 Southern States established the black public colleges or designated existing institutions to receive land-grant funds. The Smith-Lever Act of 1914 established the foundation for Cooperative Extension Services in the States which forged a direct link between the food and agricultural sciences, the producers, and the public.

In responding to rising world food and fiber shortages, Congress passed the Food and Agriculture Act of 1977. Title XIV of the Act recognized the need for the U.S. Department of Agriculture to strengthen its commitment to provide the Nation with adequate supplies of high-quality food and fiber and named the Department as the lead agency for food and agricultural science. It emphasized the distinct mission of agricultural research, Extension, and teaching, and it affirmed the necessity of improving coordination of agricultural research within a pluralistic and cooperative research system.

Partly in response to this mandate, the Science and Education Administration was formed, integrating for the first time at the Federal level, the Department's research, education, and Extension functions in food and agriculture. The following program units of SEA were created: Agricultural Research, Human Nutrition, Cooperative Research, Extension, Technical Information Systems, and Higher Education.

Agricultural Research is the largest component of SEA. AR employs more than 2,700 scientists who conduct research at 148 locations in the 50 States, Puerto Rico, the Virgin Islands, and in several foreign countries. AR's budget is about 45 percent of the total appropriation for SEA. For comparison, AR's annual budget is about half of the total agricultural research effort of all States. Agricultural research and development expenditures by the private sector are estimated to equal or exceed those of both SEA/AR and the States. Until World War II, the principal expenditures in science and technology by the Federal Government were for agricultural research. Currently, Federal funds for agricultural research represent only 2.2 percent of the total Federal research and development budget in contrast to about 40 percent in 1940.

The U.S. food and agricultural research system has a complex structure, with intricate interrelationships among the participants. The traditional components of this national agricultural research system include several U.S. Department of Agriculture agencies; the State agricultural experiment stations; other components of the land-grant universities, especially colleges of agriculture and home economics; the colleges designated in 1890 and Tuskegee Institute; and the schools of forestry and veterinary science. Significant contributions are also made by other Federal agencies, other colleges and universities, and independent research organizations, in addition to the food and agriculture industry. Much of SEA/AR's research is conducted cooperatively with the State agricultural experiment stations, and AR

scientists have close working relationships with a wide variety of disciplines throughout the entire national and international scientific communities in universities and other research complexes.

As the U.S. Department of Agriculture's in-house agricultural research unit, SEA/AR has major responsibilities for conducting and leading the national agricultural research effort. SEA/AR provides initiative and leadership in five areas:

- * Research on broad regional and national problems.
- * Research to support Federal action and regulatory agencies.
- * Expertise to meet national emergencies.
- * Research support for international programs.
- * Scientific resource to the Executive Branch and Congress.

At present, our reserves of technology and new knowledge are being consumed faster than they are being replenished. There is a general consensus that world food and fiber demands will continue to increase into the 21st century, regardless of how effective population control measures may be. The most reliable and cost effective way to ensure food and fiber supplies adequate to meet U.S. and world needs by 1985 and beyond is the more rapid development and adaptation of new technology to increase agricultural productivity. This, in turn, depends on a research effort adequate to provide the basis for the required new technology.

Crop yields and animal productivity appear to have reached a plateau. The percentage of annual increase in agricultural production and technology has declined in recent years. Significant additional investments in agricultural research will be required to change these trends.

Several growing national concerns and emerging opportunities will require a Federal agricultural research program that is dynamic, forward-looking, flexible, balanced, and well grounded in fundamental research. Examples of problems for which a strong and vigorous Federal agriculture research program can contribute significantly to solutions include biomass for energy and alternative sources of energy, conservation of our soil and water resources while increasing agricultural productivity and maintaining environmental quality, husbanding our diminishing water resources for agriculture, and reducing losses in agricultural production, processing, and food distribution. Potentially, significant new challenges which can best be met by a strong Federal agricultural research effort also include the application of recombinant DNA technology to a vast array of food and fiber research opportunities. SEA/AR's basic and applied research program is designed to achieve breakthroughs in knowledge that will support these new and emerging food and agricultural technologies.

The Partnership with State Agricultural Experiment Stations--The American partnership of Federal/State Governments in agricultural research and development is unique among the nations of the world. The State agricultural experiment stations, with mainly local and regional interests, work in cooperation with SEA/AR and contribute to national and broad regional research efforts. Collectively and individually, the State agricultural experiment stations are major contributors to the success of American agricultural research and development.

In addition, the close linkages of this food and agricultural research system with the Cooperative Extension Services not only facilitate the transfer and application of new technology and principles but also provide a feedback mechanism which helps to direct resources in solving the most relevant and pressing problems facing producers, processors, consumers, and other users of food and agricultural research results.

A major contribution of SEA/AR to the synergistic values of this association is the fostering of the working partnership itself. This working partnership includes SEA/AR and the State agricultural experiment stations which cooperatively assemble special multidisciplinary groups of scientists, engineers, economists, and others for responding to major problems requiring diverse technical expertise. The partnership includes joint program planning, joint support, and joint efforts to address mutually agreed upon high-priority problems and ensures maximum contribution of the system to local, State, and national economies.

The Association with Industry—SEA/AR maintains a mutually productive working relationship with food and agricultural scientists of the private sector. Maintenance of the linkages established between SEA/AR and industry is essential for the continued stimulation of innovative product and process development and further increases in the Nation's agricultural productivity.

Many agricultural industries conduct research on agricultural matters to meet their own immediate and long-range needs. In addition, some agricultural associations and institutes, as well as several private foundations, invest some of their resources in support of agricultural research conducted by the public sector. SEA/AR is an active member of the Agricultural Research Institute, a nonprofit association of public and private organizations concerned with agricultural research.

Industrial research in agriculture is largely concerned with new product development, engineering, and process or machinery improvements. The public sector is more concerned with basic and applied research and stresses high-risk, long-term research. This is generally considered to be the proper division of emphasis and the appropriate basis for providing a total U.S. food and agricultural research program that encompasses the full spectrum necessary to meet the diverse needs of U.S. farmers, producers, processors, and consumers.

Historically, SEA/AR's cooperative efforts with industry have addressed problems relating to the entire food system including production, protection, processing, marketing, and distribution. SEA/AR also maintains a substantial program dealing with various aspects of food quality and safety.

SEA/AR's long-standing working relationship with industry ensures that research findings by SEA/AR scientists are rapidly incorporated into creating usable products and processes for the benefit of consumers and producers.

SUPPORTING INFORMATION

Organization and Functions of SEA/AR

AR's research is conducted at approximately 148 locations in the 50 States, Puerto Rico, the Virgin Islands, and in several foreign countries. Much of the work is conducted in direct cooperation with the State agricultural experiment stations or other State and Federal agencies. Central offices for the Administrator and AR staff are maintained in the Washington, D.C., metropolitan area.

Central Offices

The Administrator of AR has direct responsibility for the leadership, management, and direction of the programs and activities assigned to Agricultural Research. He provides advice and support to USDA's Director of Science and Education in formulating national agricultural research policy and in coordinating research activities of the Department. The Administrator is assisted in these activities by the National Program Staff (NPS). Members of this staff also serve as National Research Program Leaders with direct responsibility for the technical excellence of the AR program nationally. The NPS develops, reviews, and evaluates AR programs to ensure that the proper scientific interaction, balance, and distribution of effort are focused on major national and regional problems. They serve as the Administrator's principal staff for exercising his authority in managing AR national research programs. To this end they--

- * Establish policy for program planning, evaluation, budgeting, and coordination, with emphasis on national programs, goals, and objectives.
- * Provide technical leadership on a national basis, develop plans, and coordinate AR research programs in assigned areas of responsibility.
- * Conduct onsite reviews with scientists and their regional and area/center managers to ensure that specific programs meet national goals and objectives and that concerns of research users are recognized.
- * Determine the need for, plan, and conduct national workshops that will provide national interaction of research leaders and regional and area/center managers in the pursuit of program objectives.
- * Carry out national program evaluation and assessment of program balance considering input, objectives, needs, priorities, and plans.
- * Participate in the development, presentation, and justification of the AR budget.
- * Provide liaison at the national level with other Federal Departments and agencies, Congress, agribusiness industries, commodity groups, and the public.
- * Develop and revise, as needed, the structure and content of the national research programs.

Field Offices

Regional Offices—Four Regional Administrators, along with the National Program Staff, assist the Administrator in establishing policy for program planning,

evaluation, budgeting, and coordination in individual regions. Consistent with national program policies, plans, and objectives, Regional Administrators—

- * Integrate regional programs with national program policies and objectives.
- * Coordinate and implement program planning, review, and evaluation within the region.
- * Direct and execute programs within the region.
- * Participate in planning and conducting onsite reviews with the National Program Staff.
- * Represent AR in planning and executing activities of the Regional Council and Research Committee sponsored by USDA, the State agricultural experiment stations (SAES), and industry.
- * Participate in budget development.
- * Recommend new and revised research goals and activities.
- * Participate with the National Program Staff in approving research plans for individual locations.

Area and Major Research Centers

Directors of areas and major research centers—

- * Assist the Regional Administrator in establishing policy for all aspects of program planning, evaluation, budgeting, and coordination for the region.
- * Formulate and recommend area or center policies and objectives for area or center program operations.
- * Coordinate and implement program planning, review, and evaluation within the area or center.
- * Direct and execute programs within the area or center that contribute to the goals and objectives of AR and SEA as a whole.
- * Participate with the National Program Staff, Regional Administrator, and scientists in carrying out onsite reviews.
- * Advise the Regional Administrator and the National Program Staff on area or center research programs relating to industry, State, and national problems and needs.
- * Work with the Regional Administrator and the regional staff in developing information needed by the National Program Staff and other headquarters staffs for program planning and evaluation at the national level.

Locations of Regional and Area Offices and Major Research Centers

NORTHEASTERN REGION

Regional headquarters: Beltsville, Md.

Area Offices

North Atlantic Area, Ithaca, N.Y. (includes N.Y., Pa., N.J., Vt., N.H., Maine, Conn., Mass., Md., Del., and W. Va.)
Beltsville Agricultural Research Center, Beltsville, Md.
Plum Island Animal Disease Center, Orient Point, N.Y.
Eastern Regional Research Center, Wyndmoor, Pa.

NORTH CENTRAL REGION

Regional headquarters: Peoria, Ill.

Area Offices

Illinois-Indiana-Ohio Area, Lafayette, Ind.
Michigan-Minnesota-Wisconsin Area, St. Paul, Minn.
Mid-Great Plains Area, Columbia, Mo. (includes Iowa, Mo., Nebr., and Kans.)
Dakotas Area, Fargo, N. Dak.
Northern Regional Research Center, Peoria, Ill.
National Animal Disease Center, Ames, Iowa

SOUTHERN REGION

Regional headquarters: New Orleans, La.

Area Offices

Florida-Antilles Area, Gainesville, Fla. (includes Fla., Puerto Rico, and V.I.)
Athens, Georgia Area, Athens, Ga.
Alabama-Georgia-South Carolina Area, Tifton, Ga.
Delta States Area, Stoneville, Miss. (includes Miss., La., and Ark.)
Mid-Atlantic Area, Raleigh, N.C. (includes N.C., Tenn., Ky., and Va.)
Oklahoma-Texas Area, College Station, Tex.
Subtropical Texas Area, Weslaco, Tex.
Southern Regional Research Center, New Orleans, La.

WESTERN REGION

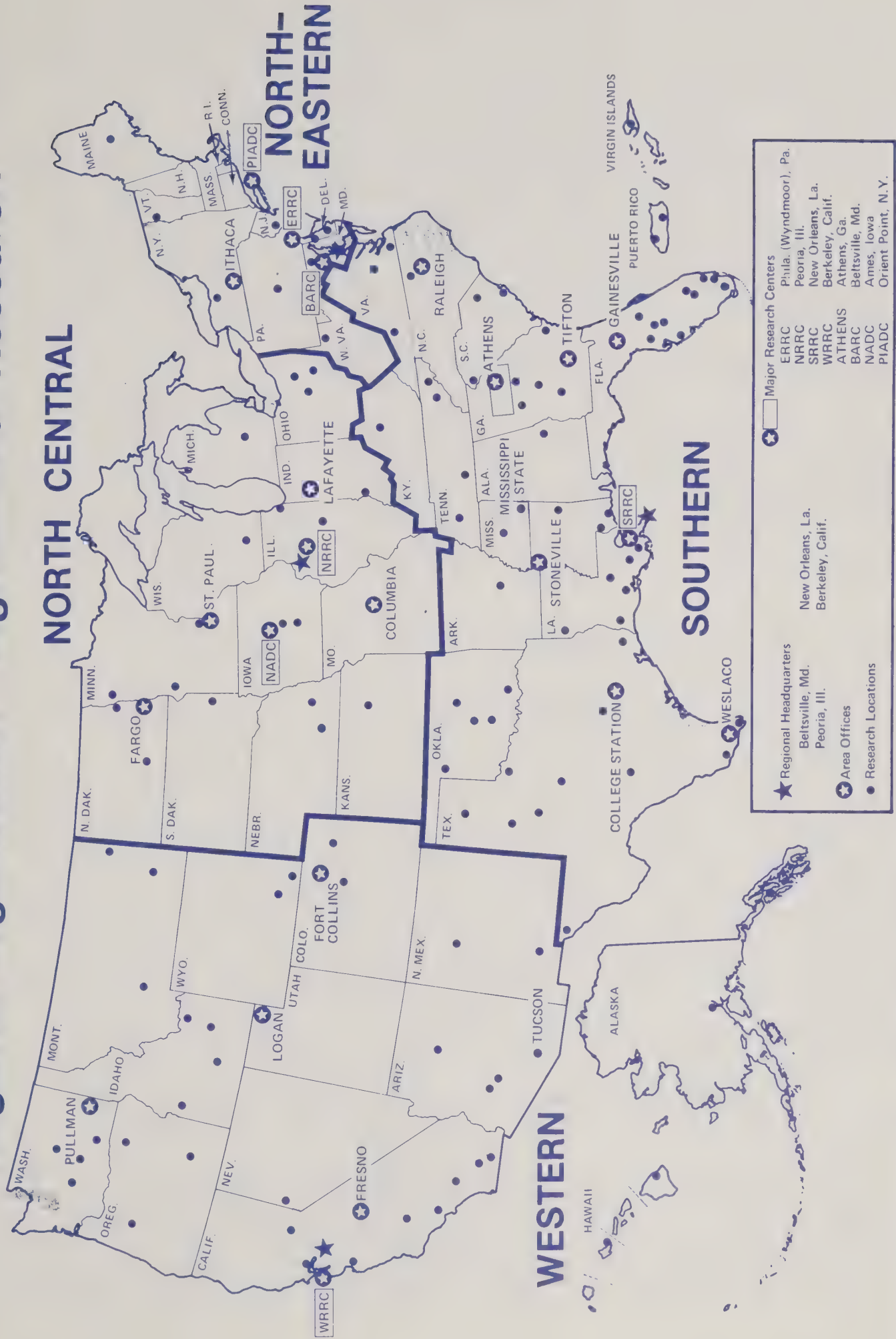
Regional headquarters: Oakland, Calif.

Area Offices

California-Hawaii Area, Fresno, Calif.
Rocky Mountain Area, Ft. Collins, Colo. (includes Colo., Wyo., Mont., and Alaska)
Desert Southwest Area, Logan, Utah (includes N. Mex., Ariz., Nev., and Utah)
Pacific Northwest Area, Pullman, Wash. (includes Oreg., Wash., and Idaho)
Western Regional Research Center, Albany, Calif.

SCIENCE AND EDUCATION ADMINISTRATION

Regional Organization - - Agricultural Research



SEA's Cooperative Research and Extension programs are carried out under state level direction, with agricultural experiment stations and with state and county offices respectively.

Facilities of SEA/AR

The agricultural research facilities of SEA/AR are extremely diverse and unequalled throughout the world. Research is conducted at 148 locations that range in size from small one-scientist stations to the more than 450-scientist facility at the Beltsville Agricultural Research Center (BARC).

Most facilities are owned and operated by SEA/AR. But 11 locations are provided by the U.S. General Services Administration, and 17 are leased. Some locations are designed to address research problems that have a narrow or limited focus. Other facilities, such as BARC, cover a wide array of problems best addressed by a multidisciplinary approach, and they require equipment and facilities for many scientific disciplines and activities. The facilities are located throughout the United States and the Territories so that problems of regional and national scope can be addressed under the most favorable and appropriate research environment. Many are located on university campuses and State agricultural experiment stations to help foster cooperation and interaction with State and private research workers.

This type of arrangement encourages joint use of expensive instruments and equipment and other essential facilities, such as libraries, computers, and experimental plots. The following is a descriptive listing of SEA/AR facilities grouped according to the following major areas of agricultural research activity: National and Regional Centers; Crop Production and Protection; Soil, Water, Air, and Natural Resources; Animal Production and Protection; Post Harvest Technology; and Family and Rural Development.

Major National and Regional Centers

Beltsville Agricultural Research Center--With 450 full-time scientists, BARC is the largest center of excellence for national agricultural research in the United States and, possibly, the world. Over 7,000 acres (2,833 hectares) of land are intensively utilized for plant and animal research. The hundreds of buildings meet the many specialized needs of the research program and house specialized equipment, such as the computerized calorimeter in the Energy Metabolism Laboratory. The National Agricultural Library located on the center's grounds is an important resource for all scientists. The proximity of BARC to Congress, regulatory and research agencies, chemical and supply houses, and numerous other research institutions is unique. The center provides a panorama of agricultural research for visitors from other agencies and from other nations of the world.

BARC has unique interdisciplinary teams of scientists with expertise in all agricultural research disciplines and nearly all commodities. The center is in a unique position to assemble a large number of resources to attack specific problems of national importance. In addition, BARC houses major national taxonomic collections of insects, fungi, seeds, nematodes, animal parasites, and rhizobia. The center also provides dam and sire evaluations for the Dairy Herd Improvement Program. The availability of these collections and evaluations are essential national services for other scientists, industry, and regulatory agencies. Beltsville, Md.

Regional Research Centers and the Russell Research Center--The four regional research centers, together with the Russell Research Center, comprise a resource unmatched throughout the world. Each of the centers represents a unique concentration of specialized scientific knowledge, applied technology, and highly specialized instrumentation and equipment essential to providing the basic research and applied research to solve the complex problems of specific commodity interest.

The scientists at these five centers are nationally and internationally recognized in their respective fields of expertise. They provide the combined scientific capability and understanding of diverse technologies to address the problems faced by action and regulatory agencies.

Each of the centers has a critical mass of scientific and engineering expertise necessary to respond to emergency needs of national importance and to provide the continuity of effort required to conduct long-term basic research essential to the resolution of applied and developmental problems. They are especially capable of dealing with problems associated with postharvest technologies critical to the delivery of high-quality, nutritious, and safe food and fiber to the consumer. Thus, the centers bridge the gap that represents the interests of industry, agriculture, and the consumer. Eastern Regional Research Center, Wyndmoor, Pa.; Northern Regional Research Center, Peoria, Ill.; Southern Regional Research Center, New Orleans, La.; Western Regional Research Center, Albany, Calif.; and Richard B. Russell Research Center, Athens, Ga.

National Arboretum--The U.S. National Arboretum, established by an Act of Congress on March 4, 1927, comprises 444 acres (180 hectares) in Washington, D.C. In 1973, it was placed on the National Register of Historic Places. The arboretum is a research institution for the improvement of plants through introduction, breeding, and selection.

It has a major herbarium containing 500,000 botanical specimens for research and plant identification. The arboretum publishes botanical findings and provides technical information to the public. In addition, it exchanges seed and plant material with other scientific institutions throughout the world to provide researchers with needed genetic resources and to enrich the educational display collections at the arboretum.

Although not a park in the usual sense, the arboretum provides ample opportunity for observing and enjoying plants. There is a steady flow of scientists, landscape architects, gardeners, school children, and tourists from around the world--as many as 20,000 people a day--visiting the displays at the arboretum. Washington, D.C.

Crop Production and Protection Facilities

Plant Introduction Station--The U.S. Plant Introduction Station is the only station processing foreign plant germplasm that must be quarantined upon arrival. It is located in a nonagricultural area to ensure isolation of imported material, yet it is without 10 miles (16 kilometers) of the expertise available at BARC.

Facilities include 12,000 square feet (1,115 square meters) each of specially designed greenhouses and screenhouses for the maintenance of prohibited categories and foreign germplasm. Onsite expertise is available for performing indexing tests to detect a wide array of virus, mycoplasmas, protozoa, spiroplasmas, and viroids. Some 25 buildings (including 13 glass houses) contain three research laboratories, offices, cold rooms, and farm equipment. The grounds have plant varieties assembled from 1925 to the present, including 800 apple, 600 pear, 250 stone fruit, and 700 woody ornamental varieties. Glenn Dale, Md.

Regional Plant Introduction Stations--These are located in the four geographical regions of the country for close cooperation with the State agricultural experiment stations. Each station has the responsibility for receiving, maintaining, increasing, distributing, and evaluating seed of a specific array of crop and potentially new crop species. These facilities are a key part of the national and international plant genetic resources system. And they provide valuable services to plant breeders, geneticists, and other scientists in the public and private sectors. Experiment, Ga.; Ames, Iowa; Geneva, N.Y.; and Pullman, Wash.

National Seed Storage Laboratory--The National Seed Storage Laboratory (NSSL), located on the campus of Colorado State University, has been in operation since 1958. The laboratory maintains plant germplasm as a base collection for the United States and, through formal and informal cooperation, for the global network of genetic resources centers.

Several million seeds, representing nearly 100,000 varieties, are stored in 11 cold storage rooms. In addition to preserving plant germplasm, the NSSL conducts research on seed deterioration and genetic changes during storage and the relationships between seed moisture, storage climate, and packaging materials. Fort Collins, Colo.

U.S. Delta States Agricultural Research Center--This basic, applied, and developmental research center emphasizes multidisciplinary, mission-oriented research having the following objectives: Developing technology for improving crop production, harvesting, and processing efficiency; developing cost-effective technology for reducing crop losses caused by weeds, diseases, insects, and nematodes; improving environmental quality; and improving yields and quality of crops. Plant scientists, engineers, weed scientists, entomologists, plant pathologists, plant physiologists, chemists, nematologists, soil scientists, and others cooperate in contributing to these objectives.

Resources include controlled growth phytotrons; greenhouses; research quarantine facilities for insects, plant pathogens, nematodes, and weeds; and large areas of land for field experiments. Research at the center is planned in cooperation with the States and industry to ensure emphasis on regional and national problems not being addressed by State or industrial research. Stoneville, Miss.

Peanut Production, Disease, and Harvest Research Laboratory--This laboratory is located in the center of the Virginia-North Carolina peanut production area. An interdisciplinary team of breeders, plant pathologists, and engineers work together to develop peanut production systems having higher yield and higher quality of product applicable in both Virginia and North Carolina. The drying laboratory provides unique facilities for controlled studies of peanut drying. Work at this facility is coordinated with other research at Raleigh, N.C., concentrating on the storage and marketing of peanuts. Suffolk, Va.

Barley and Malting Quality Laboratory--This laboratory, which has unique facilities for determining malting quality, serves Federal and State research programs in the north central, Mississippi Valley, and western barley-growing regions. Specialized facilities for studying the biochemistry of malting are also provided to serve these projects, as well as to investigate basic processes involved in malting. Madison, Wisc.

Cereal Disease Laboratories--These two laboratories have specialized facilities for investigating the behavior of major cereal diseases of national scope. There are teams of two to seven scientists at each location. The laboratories maintain national oversight of the epidemiology of major cereal diseases, conduct and maintain national surveys of disease races, and investigate the basic genetics of disease resistance. Cereal Rust Laboratory, St. Paul, Minn.; Corn Virus Research Laboratory, Mississippi State, Miss.

Rice Research Laboratory--This laboratory is located on a State agricultural experiment station comprising nearly 1,000 acres (405 hectares) of land. SEA/AR scientists study rice breeding, quality, diseases, drying after harvest, and storage insects. Onsite solar collectors and heat storage units enable engineers to conduct pilot tests to improve rice drying with minimum use of energy derived from a petroleum source. More than 25 storage bins permit the study of rice quality preservation over a period of several years. The AR team effort encourages development of a quality rice variety that is resistant to plant diseases and post-harvest insect attack. Numerous commercial rice mills are located nearby that permit study of insect contamination of processed rice. Beaumont, Tex.

Cotton Research Laboratories--These four laboratories are located in ecological production regions that differ in soil type, climate, water management, and pests. At each location, teams of 9 to 16 geneticists, agronomists, physiologists, and plant protection scientists work together to develop improved cotton production systems. SEA Western Cotton Research Laboratory, Phoenix, Ariz.; U.S. Cotton Research Station, Shafter, Calif.; Cotton Insects Research Laboratory, Brownsville, Tex.; and Cotton Research Laboratories, College Station, Tex.

Sugarcane Research Laboratories--These two laboratories are located in sugar production regions with different ecological, soil types, water management, disease, insects, and cultural practices. Multidisciplinary teams include plant breeders, geneticists, agronomists, plant pathologists, plant physiologists, weed control specialists, and entomologists. These locations have unique facilities, including large, tall, isolation-crossing houses with rail carts that move plants indoors at night, air-conditioned photoperiod houses, growth chambers, temperature- and humidity-controlled storage rooms, and sugarcane milling and harvesting equipment. Regular office-laboratory space is provided for 10 to 14 scientists. Canal Point, Fla.; Houma, La.

Sugarcane and Sweet Sorghum Sirup Laboratory--This is the only laboratory in the United States that conducts research on sugarcane and sweet sorghum for sirup, a specialty commodity in the Southeast. Sweet sorghum is also researched as a crystalline sugar crop and as an alcoholbiomass crop. The facility is on 100 acres (40 hectares) of prime production land in an ecological situation conducive to early maturity of plants with minimal frost damage. The research team consists of agronomists and plant pathologists. The facility has special sugarcane milling and harvesting equipment, a sirup processing laboratory, and controlled temperature and humidity storage rooms. Meridan, Miss.

Sugarcane Mechanization Laboratory--This facility provides shops and engineering laboratories that meet the space requirements for construction and testing of large field machines being developed for use in sugarcane production. The equipment developed at this facility is for use in both the Florida and Louisiana cane production areas. Development and preliminary testing is conducted in SEA/AR facilities; field testing is done in State- and privately owned fields. Belle Glade, Fla.

Crops Research Laboratories--These two laboratories are located in ecological production regions that differ in soil type, climate, water management, and pests. The research conducted on sugarbeets and on forage and range is aimed at breeding, production practices, and pest control. Multidisciplinary teams of 10 to 12 scientists include plant breeders, geneticists, agronomists, plant pathologists, physiologists, and nematologists. In addition to office-laboratory space, the facilities include greenhouses with special isolation chambers for pollination, growth chambers, and temperature- and humidity-controlled chambers for sugarbeet storage. Fort Collins, Colo.; Logan, Utah.

Sugarbeet and Vegetable Research Station--This laboratory serves the unique vegetable and sugarbeet production area of California's Salinas Valley. The valley opens to the ocean, making the climate ideal for cool-season vegetables and sugarbeets. The facility includes an office-laboratory building, special greenhouses for isolation breeding, an electron microscope, a fully equipped agricultural engineering shop, and 100 acres (40 hectares) of field plots. Salinas, Calif.

U.S. Vegetable Laboratory--This central facility was originally established as a regional laboratory to serve all the Southeastern States for breeding, production, and protection of vegetable crops. The facility is located on 350 acres (142 hectares) of prime vegetable cropland. It includes a large office and laboratory, a seed storage building, special insect rearing rooms, working laboratories, vegetable storage facilities, and 12,000 square feet (1,115 square meters) of

greenhouses for teams of 10 to 14 scientists consisting of geneticists, horticulturists, pathologists, agronomists, entomologists, nematologists, and a chemist. The Southeastern Forestry Research Laboratory is also located on the property, and a State substation occupies adjacent land. Charleston, S.C.

Tree Fruit and Tree Nut Research Stations--Six regional research stations are located in ecological production areas that differ in fruit crop adaptation, soil type, climate, water management, and pests. Tree fruit and nut crop studies vary by region and are conducted on apples, pears, peaches, and other stone fruits and on pecans, blueberries, and strawberries.

Teams of horticulturists, geneticists, pathologists, physiologists, entomologists, soil scientists, and agricultural engineers cooperate to develop new fruit and nut varieties and improve cultural and harvesting systems. Scientific teams range from 2 to 18 scientists at the various locations. The research with the perennial fruit crops is dedicated to longrange problems not easily initiated or justified by individual State agricultural experiment stations. Applalachian Fruit Research Station, Kearneysville, W. Va.; Production, Harvesting, and Handling of Tree Fruits, Wenatchee, Wash.; W. R. Poage Pecan Field Station, Brownwood, Tex.; Small Fruits Research Station, Poplarville, Miss.; Southeastern Fruit and Tree Nut Research Laboratory, Byron, Ga.; and U.S. Horticultural Research Laboratory, Orlando, Fla.

U.S. Date and Citrus Station--The laboratory, in California's Imperial Valley, the center of the U.S. date industry, has unique citrus rootstock and date variety collections. The comprehensive citrus rootstock collection is a basic source for disease-resistant and salt-tolerant rootstocks for AR research at Weslaco and Orlando as well as for State agricultural experiment station researchers. The large and unique collection of named Old World date varieties was recently repropagated. The collection is the only date germplasm repository in the United States and serves as the germplasm resource for U.S. date breeding and cultural research as well as for cooperative international date research. It will be part of the U.S. National Germplasm Repository System. The station, in addition to office and laboratory space, has specialized facilities for storing and drying dates. Indio, Calif.

Fruit and Nut Crop Specialty Crop Repository--This repository has been specifically located and maintained to provide vegetatively produced plant germplasm for U.S. scientists working with pome fruits, small fruits, filberts, hops, and mint. Involved are the collection, propagation increase, maintenance, and preliminary evaluation of such crops. This repository, which is managed by a curator, serves the public, industry, private breeders, and other plant scientists, and it is distinct and separate from other breeder's working collections. The facility includes office-laboratory space, screenhouses, greenhouses, isolation field plots, and temperature- and humidity controlled storage chambers. Corvallis, Oreg.

Mayaguez Institute of Tropical Agriculture--The Mayaguez Institute of Tropical Agriculture's (MITA) mission is to aid continental U.S. agriculture through winter nurseries that permit year-round outdoor experimentation and development; to introduce, evaluate, select, multiply, preserve, and develop tropical crop germplasm of interest to U.S. agriculture; to aid the agricultural of Puerto Rico by carefully selected cooperative studies; and to contribute to the development of agriculture in the tropics. The MITA consists of 1 major building and 34 smaller support buildings on 207 acres (84 hectares) of land adjacent to the University of Puerto Rico. In addition, a 125-acre (51-hectares) farm, located about 25 miles (40 kilometers) north of Mayaguez at Isabela, consists mainly of experimental plots that include winter nursery operations. The land at Mayaguez provides a unique location for a priceless collection of tropical plant germplasm. Mayaguez, Puerto Rico.

Subtropical Horticultural Research Station--This station is situated on 200 acres (81 hectares) of land south of Miami. The staff consists of entomologists, plant pathologists, horticulturists, and an organic chemist. Research at the facility involves pest control, reduction of marketing losses, and varietal and cultural improvement of subtropical plants. The station maintains unique germplasm collections of coffee, cacao, sugarcane, and other tropical and subtropical plants. The facility also provides for Federal and State cooperative programs on survey and detection of pests, nursery inspection, postentry quarantine inspection, and development of coconut palms resistant to lethal-yellowing disease. Miami, Fla.

Ornamental Plant Research Laboratory--This central laboratory was established to serve the needs of florists and nursery crop producers in the Pacific Northwest. The office-laboratory building is occupied by a multidisciplinary team of five to six scientists consisting of plant pathologists, physiologists, and a soil scientist. The facility includes greenhouses, special isolation houses for pesticide research, and shade houses. Fieldwork is done on nearby land leased from the State. Corvallis, Oreg.

Forage-Range-Livestock Research Stations--These five SEA/AR stations are located in different ecological production regions. Soil type, plant and animal species, climate, and other environmental factors interact to create unique agricultural production situations of national importance. At each location, teams of from 4 to 10 scientists of many disciplines--breeders, geneticists, physiologists, agronomists, range and animal scientists, pathologists, and entomologists--interact to solve problems and to increase production of forage, range, and livestock. These teams also work closely with scientists of other research agencies. U.S. Regional Pasture Research Laboratory, University Park, Pa.; North Central Dairy Forage Research Center, Madison, Wis.; U.S. Southern Great Plains Field Station, Woodward, Okla.; Squaw Butte Research Station, Burns, Oreg.; Jornada Experimental Range Management Station, Las Cruces, N. Mex.

Crop Commodity Insect Control Research Facilities--These facilities provide locations where a critical mass of scientists--entomologists, plant breeders, geneticists, plant physiologists, chemists, engineers, and others--can cooperate in efforts to develop tactics, strategies, and systems that may reduce losses of a major commodity to insect pests. These concentrations of personnel permit the effective use of rearing facilities, greenhouses, and specialized equipment. In addition, they facilitate the interdisciplinary research required to solve complex pest management problems of national importance. Cotton Insects Physiology Research Unit, Baton Rouge, La.; Cotton Insects Research, Brownsville, Tex.; Southern Grain Insects Research Laboratory, Georgia Coastal Plain Experiment Station, Tifton, Ga.; Northern Grain Insects Research Laboratory, Brookings, S. Dak.; Citrus Insects Research, Weslaco, Tex.; Fruit and Vegetable Insects Research, Vincennes, Ind.; Yakima Agricultural Research Laboratory, Yakima, Wash.; Subtropical Horticultural Research Station, Miami, Fla.; Boll Weevil Research Laboratory, Mississippi State, Miss.; Boll Weevil Eradication Research Laboratory, Raleigh, N.C.; Boyden Entomology Laboratory, Riverside, Calif.

Bee Research Laboratories--These facilities of AR are equipped with specialized support buildings and cages. For example, isolation is required so large numbers of normal and specialized bee colonies can be maintained near the laboratories. In the laboratories, a critical mass of scientists with special expertise work on problems of importance to the whole country. Bee Breeding and Stock Center Laboratory, Baton Rouge, La.; Carl Hayden Bee Research Center, Tucson, Ariz.; Systematics Research Laboratory, Logan, Utah.

Offshore Insect Control Research Facilities--AR facilities in Hawaii and St. Croix allow entomologists to conduct research and to produce experimental materials, such as sterile fruit flies, in isolated microcosms of mainland agricultural conditions. At the same time, the scientists can conduct research of direct

benefit to these tropical and subtropical areas. This access to isolated locations is a unique national resource, because it makes it possible to evaluate procedures for managing pests that cause widespread damage to mainland crops and livestock. SEA Fruit Flies Laboratory, Honolulu, Hawaii; Hawaiian Agricultural Experiment Station, Hilo, Hawaii; Federal Experiment Station, Kingshill, St. Croix, V.I.

Biological Control Research and Quarantine Facilities--These laboratories house specialists experienced in foreign and domestic field and laboratory studies of exotic beneficial organisms that may be used to control pest insects, pathogens, and weeds of national importance. The concentration of expertise (in a few, high-security, quarantine facilities where research can be done safely) produces an efficient and effective combination of fundamental and applied research. These facilities are used by the State departments of agriculture, State agricultural experiment stations, USDA's Animal and Plant Health Inspection Service (APHIS) (Plant Protection and Quarantine), USDA's Forest Service, and others who wish to make actual field releases of organisms. Plant Disease Research Laboratory, Frederick, Md.; Delta States Research Center, Stoneville, Miss.; Beneficial Insects Research Laboratory, Newark, Del.; Biological Control of Weeds Laboratory, Albany, Calif.; Biological Control of Insects Research Unit, Columbia, Mo.; Biological Control of Insects Laboratory, Tuscon, Ariz.

Aquatic Weed Research Laboratories--Multidisciplinary teams including weed scientists, plant physiologists, biochemists, chemists, soil scientists, entomologists, plant pathologists, ecologists, marine biologists, and others cooperate to develop ecological, mechanical, biological, chemical, and integrated aquatic weed management systems for the control of aquatic weeds in irrigation systems, drainage canals, water reservoirs, farm ponds, and other aquatic sites. Greenhouses, controlled-growth phytotrons, experimental ponds, model irrigation systems, quarantine, and other unique facilities are available for evaluating fish, insects, plant pathogens, snails, mammals, other biological organisms, selective chemicals, and water management as means of controlling aquatic weeds. Cooperating with SEA/AR in these efforts are Federal agencies, State agricultural experiment stations, and industrial organizations which generally do not maintain research staffs and facilities for research on aquatic weeds. Fort Lauderdale, Fla.; Stoneville, Miss.; Prosser, Wash.; Davis, Calif.

Metabolism and Radiation Research Laboratory--This national laboratory was established in 1964 to investigate the fate of pesticides, drugs, and other agricultural chemicals applied to crops, feeds, and livestock and to identify and explore vulnerabilities in insects that can be exploited in managing insect pests without increasing hazards to biological control agents, bees, livestock and humans. The laboratory has a highly trained interdisciplinary staff, unique equipment for irradiating insects, and an excellent assemblage of high-precision chemical instrumentation. It is the only U.S. location where research on the screwworm will be permitted after 1981, since secure facilities will be available and since, in any case, the insect could not overwinter in that area. The laboratory established enzyme differences between wheat and wild oats that have been exploited by industry, established that DES is stored in the livers of livestock, and discovered the first practical method of sexually sterilizing boll weevils. Fargo, N. Dak.

Insect Attractants, Behavior, and Basic Biology Research Laboratory--The research done at this laboratory is basic to management of insects that are pests of crops, stored products, and humans. The facility is unique in the world, in that it has the potential for doing basic research on most of the processes of growth and development and of reception and response that are now believed to be the key to ecologically sound, selective, and safe methods of insect pest management.

Unique instrumentation and skills have enabled the laboratory to solve problems that previously appeared to be intractable; for example, identifying and synthesizing attractants of serious insect pests. As a result, attractant pheromones for the Japanese beetle and for peach tree borers are now in commercial use. Behavioral and bioengineering research has yielded concepts and techniques that have been adopted to assure the quality of mass-reared sterile screwworms, Mediterranean fruit flies, and so forth. The use of pheromones and insect growth regulators as a means of protecting stored peanuts and other agricultural commodities has been developed to the pilot stage. Gainesville, Fla.

Soil, Water, Air, and Natural Resource Facilities

U.S. Plant, Soil, Nutrition Laboratory--This is one of the few laboratories in the world where scientists of different disciplines are grouped together to conduct research on the geochemical and chemical processes involved in the cycling of nutritionally important substances in rocks, soils, plants, and animals. The research program includes factors controlling distribution and availability of nutrients and the structure, synthesis, metabolism, and role of biologically important substances in the growth and development of plants, animals, and humans. Ithaca, N.Y.

National Tillage Machinery Laboratory--This is the only laboratory in the United States with the capability of using soil bins and highly sophisticated instrumentation to study the relationships between soil physical properties, tillage and traction devices, and machine performance, including the effects of machine weights, traction, flotation, and machine-mobility problems. Auburn, Ala.

Laboratories for Erosion and Sedimentation Studies--These laboratories have physical facilities--flumes, wind tunnels, raindrop towers, rainulators, and fieldplots that are unique for studying the physical processes involved in erosion, sediment transport, and sediment deposition. Multidisciplinary groups of scientists--engineers, soil scientists, chemists, agronomists, and biologists--work together to understand the processes involved in water and wind erosion, sediment transport, and sediment deposition and to develop methods for controlling erosion and sedimentation. National Erosion Research Laboratory, West Lafayette, Ind.; U.S. Big Spring Field Station, Big Spring, Tex.; USDA Sedimentation Laboratory, Oxford, Miss.

Watershed Research Centers--These centers, which are located in major climatological zones, operate a unique set of intensively instrumented experimental facilities for evaluating the effects of agricultural (crop and range) activities on the environment and of human activities (urbanization and mining) on agriculture. Multidisciplinary teams of scientists and engineers use these research watersheds to assess the effects of land use and land treatment on water yield, flooding control, soil conservation, channel stabilization, and water quality for key physiographic regions.

The research program includes fundamental studies on the movement of water, sediments, and agricultural chemicals. A major objective is the development and evaluation of improved land management and conservation technologies for use by action and regulatory agencies. Federal agencies benefiting directly from the research include USDA's Soil Conservation Service; U.S. Department of the Interior's Bureau of Mines and Bureau of Land Management; U.S. Army's Corps of Engineers, and U.S. Environmental Protection Agency. Southern Plains Watershed and Water Quality Laboratory, Durant, Okla.; North Appalachian Experimental Watershed, Coshocton, Ohio; USDA Sedimentation Laboratory, Oxford, Miss.; Grassland, Soil, and Water Research Laboratory, Temple, Tex.; Southwest Rangeland Watershed Research Center, Tucson, Ariz.; Northwest Watershed Research Center, Boise, Idaho; Southern Great Plains Watershed Research Center, Chickasha, Okla.; Georgia Coastal Plains

Experiment Station, Tifton, Ga.; Northeast Watershed Research Laboratory, University Park, Pa.; Watershed Research Unit, Columbia, Mo.; Watershed Research Unit, Council Bluffs, Iowa.

Soil and Water Conservation Research Centers--These facilities are regional research centers that conduct soil and water conservation research applicable to the major land-use resource areas in which they are located. These are Federally owned facilities and are located, in many instances, in areas where there are no universities. Adequate land for field research, as well as building, is provided. In some instances, cooperative efforts with State agricultural experiment stations are maintained.

These facilities are staffed with multidisciplinary teams, including soil scientists, agricultural engineers, plant physiologists, and agronomists in order to research broad problem areas. Some basic research is also conducted that has national as well as regional significance. Appalachian Soil and Water Conservation Research Laboratory, Beckley, W. Va.; Northeast Plant, Soil, and Water Laboratory, Orono, Maine; North Central Soil Conservation Research Center, Morris, Minn.; Northern Great Plains Research Laboratory, Mandan, N. Dak.; U.S. Central Great Plains Research Station, Akron, Colo.; Snake River Conservation Research Center, Kimberly, Idaho; Imperial Valley Conservation Research Center, Brawley, Calif.; Columbia Plateau Conservation Research Center, Pendleton, Oreg.; Soil, Water, Air, and Plant Sciences Research, Weslaco, Tex.; U.S. Southwestern Great Plains Research Center, Bushland, Tex.; Coastal Plains Soil and Water Conservation Research Center, Florence, S. C.; USDA Southern Piedmont Conservation Research Laboratory, Watkinsville, Ga.; Northern Plains Soil and Water Research Center, Sidney, Mont.; High Plains Grasslands Research Station, Cheyenne, Wyo.

Water Management Laboratories--These laboratories are located within the physiographic region where major problems of water management and associated soil problems exist. Each laboratory has a group of multidisciplinary scientists--soil scientists, plant physiologists, and engineers--working together on basic relationships and conducting field experiments under regional climatic conditions.

Major crops grown in the area are used to develop improved water management technology for increased water-use efficiency and for practices to minimize soil and crop damage because of salinity. Water Management Laboratory, Fresno, Calif.; U.S. Salinity Laboratory, Riverside, Calif.; U.S. Water Conservation Laboratory, Phoenix, Ariz.; Irrigation and Soil-Plant-Water Relations Unit, Fort Collins and Grand Junction, Colo.

Animal Production and Protection Facilities

Multidisciplinary Animal Production Research Centers--In addition to the major research effort at the Beltsville Agricultural Research Center, SEA/AR has several major research locations where large-scale research with dairy and meat-producing animals is conducted by multidisciplinary teams. Several of the research stations are the largest in the country, up to 56,000 acres (22,663 hectares) in area, which enhances their ability to attract and retain high-quality scientists from many disciplines.

The unique facilities and equipment range from sophisticated chambers for energy metabolism studies on individual animals to commercial-size production units for all classes of animals. Integrated programs are conducted, and they range from very basic research to studies using large populations of animals for developing systems approaches to solve broad industry problems.

Stations are strategically located to permit replicated studies in different physiographic situations to quantify interactions among genetic, nutritional, and management variables. Thus, programs of smaller stations become integrated parts of total programs and uniquely complement the larger stations.

Many of the larger units are operated cooperatively with State agricultural experiment stations and serve as focal points for integrated research efforts, thereby enhancing effectiveness of total research programs. Such stations cannot be duplicated by any other research organization in the country. U.S. Livestock Experiment Station, Miles City, Mont.; U.S. Sheep Experiment Station, Dubois, Idaho; Roman L. Hruska U.S. Meat Animal Research Center, Clay Center, Nebr.; Southwestern Livestock and Forage Research Station, El Reno, Okla.; North Central Dairy-Forage Research Center, Madison, Wis.; Brooksville Beef Cattle Research Station, Brooksville, Fla.; Dairy Experiment Station, Lewisburg, Tenn.; Russell Research Center, Athens, Ga.

Poultry Production and Product Quality Laboratories--In addition to the Beltsville Agricultural Research Center's poultry research programs, three major poultry-production and product-quality laboratories uniquely blend basic and applied studies using multidisciplinary team approaches. In each of these research areas, the magnitude of the SEA/AR focus on specific problems exceeds that of any other organization:

- * Interrelationships of the neuro-nutritional-endocrine systems are being investigated to improve turkey egg production.
- * Unique cellular approaches are being used to study growth and the effect of stress on broilers.
- * Agricultural engineers and poultry husbandmen are working on the effects of environment and management on the meat and egg production of chickens.
- * Two approaches are being used to improve broiler product quality investigations on cage rearing systems and study of the synergistic effects of several feed mycotoxins.

Poultry Research Laboratory, Georgetown, Del.; Southeast Poultry Research Laboratory, Athens, Ga.; South Central Poultry Research Laboratory, Mississippi State, Miss.

Animal Disease Research Laboratories--The animal disease research efforts in SEA/AR are concentrated at seven locations. One of these, the National Animal Disease Center at Ames (the largest such unit in the world) has a mission to conduct basic and applied research on diseases of national importance in cattle, sheep, swine, horses, and poultry. The staff uses multidisciplinary approaches to solve animal health problems. The other animal disease laboratories are unique in that each specializes either in a single disease area or in specific diseases of a single animal specie. The laboratories are located where a disease exists and where they can readily collaborate with research scientists of other institutions. These laboratories include chemists, virologists, bacteriologists, veterinarians, physiologists, entomologists, and pathologists working together on interdisciplinary approaches to disease control.

The SEA/AR laboratories are unique, since they can do indepth studies on economically important diseases that do not cause catastrophic losses and, therefore, often do not command continued support from State or other Federal agencies. The laboratories, because of their highly skilled staffs, are excellent training locations for U.S. and foreign scientists needing specialized training. The large interdisciplinary staffs also provide the United States with a highly trained research and diagnostic staff that can be rapidly mobilized to meet any animal disease emergency. National Animal Disease Center, Ames, Iowa; Arthropod-borne Animal Disease Research Laboratory, Denver, Colo.; Animal Disease Research Unit, Pullman, Wash.; Southwestern Livestock and Forage Research Station, El Reno, Okla.; Regional Poultry Research Laboratory, East Lansing, Mich.; Southeast Poultry Research Laboratory, Athens, Ga.; South Central Poultry Research Laboratory, Mississippi State, Miss.

Facilities for Research on Internal Parasites of Animals--The national parasite research program's prime objective is to develop ways to prevent, control, or eradicate parasite infections in livestock and poultry. The major unit in the program--the Animal Parasitology Institute--is the largest in the world devoted exclusively to research on parasites of food-producing animals. Parasitologists, veterinarians, chemists, entomologists, and immunologists cooperate in interdisciplinary approaches to achieve stated goals.

The SEA/AR parasite research program, because of Federal funding, provides for unbiased testing and evaluation of new antihelmintic drugs and proposed biological parasite control programs. The scientists also prepare and maintain two internationally known tools used by parasitologists worldwide--the Index Catalogue of Medical and Veterinary Zoology and the National Parasite Collection. Both are used nationally in studies of parasitism in livestock and poultry and are indispensable in efforts to develop parasite control programs. Animal Parasitology Institute, Beltsville, Md.; Regional Parasite Research Laboratory, Auburn, Ala.

Foreign Animal Disease Research Centers--SEA/AR has unique responsibilities for research on animal diseases that do not exist in the United States but pose a continuous threat to U.S. livestock and poultry industries. The major portion of this research is conducted at the SEA/AR laboratory located on Plum Island, 1.5 miles (1.4 kilometers) off Long Island. One serious foreign disease being studied is foot-and-mouth disease, which affects all farm animals except horses and poultry. The Plum Island laboratory is the only U.S. facility where this disease can be safely studied on an island surrounded by deep, navigable waters and not connected to the mainland by a bridge or tunnel.

Another disease being studied extensively only at Plum Island is African swine fever, commonly found in the Dominican Republic and Haiti and recently reported in Cuba. There is no vaccine for this disease, which poses a serious threat to our swine population. Other foreign animal diseases that have been or are being studied are rinderpest, contagious bovine pleuropneumonia, African horsesickness, exotic strain of blue-tongue, sheep pox, duck virus enteritis, Teschen disease of pigs, swine vesicular disease, and a serious blood-parasite disease called East Coast fever.

Under strict security regulations imposed by USDA APHIS, fowl plague or influenza and exotic Newcastle disease are studied by SEA/AR at a laboratory in Athens. Another high-security facility for insect-borne foreign diseases is located in Denver. A multidisciplinary team of veterinarians, microbiologists, immunologists, biochemists, electromicroscopists, and pathologists has developed and is continuing to develop research information essential in the diagnosis, prevention, control, and eradication of serious exotic diseases of animals that might gain entry into the United States. Plum Island Animal Disease Center, Greenport, N.Y.; Southeast Poultry Research Laboratory, Athens, Ga.; Arthropod-Borne Animal Disease Research Laboratory, Denver, Colo.

Insects-Affecting-Man Laboratories--SEA/AR research on insect pests of humans is the major such effort in the world. Most of the work is conducted in Gainesville, at one of the largest and most specialized facilities of its kind. Much of the work there is done in support of the U.S. Department of Defense, which is concerned with preventing insect-borne diseases, such as malaria, dengue, and encephalitis, from reducing the efficiency of U.S. military personnel at home and abroad. In addition, personnel from the Gainesville laboratory serve as the technical nuclei for cooperative research with international organizations, such as the United Nations World Health Organization (WHO) and the U.S. Agency for International Development (USAID). A recent example of this type of cooperation was a project having to do with the control of malaria-infected mosquitoes in Central America.

Two small laboratories at Lake Charles and Gulfport are strategically located so scientists can work on regional problems and so they can also support APHIS programs. At all three locations, the multidisciplinary teams of entomologists, epidemiologists, geneticists, and engineers are able to assist where State or local organizations cannot. Personnel serve as technical advisors to action agencies, such as APHIS, in times of disease or vector outbreaks. Insects Affecting Man and Animals Research Laboratory, Gainesville, Fla.; Gulf Coast Mosquito Research Laboratory, Lake Charles, La.; Imported Fire Ant Research Laboratory, Gulfport, Miss.

Insects-Affecting-Livestock Laboratories--SEA/AR research on insects affecting livestock is the largest single component of the U.S. effort to control pest insects. The work serves the livestock industry that accounts for about half of the cash income of American farmers.

It also supports action-regulatory programs of other agencies. For example, personnel are assisting in the screwworm eradication program now being conducted by APHIS with Mexico, and plans have been made for future cooperative research with Canada's Agriculture Ministry to control the cattle grub. Other research is underway to support APHIS in efforts to control Texas cattle fever and cattle scabies.

The multidisciplinary teams of entomologists, chemists, immunologists, virologists, physiologists, and engineers at the several laboratories can be assembled and mobilized on short notice. They have the flexibility to conduct cooperative programs between AR, APHIS, State agricultural experiment stations, and other governmental organizations on a regional, interregional, and international basis. Screwworm Research Laboratory, Mission, Tex.; Arthropod-Borne Animal Disease Research Laboratory, Denver, Colo.; Midwest Livestock Insects Research Laboratory, Lincoln, Nebr.; Livestock Insects Laboratory, Beltsville, Md.; Veterinary Toxicology and Entomology Research Laboratory, College Station, Tex.; Metabolism and Radiation Research Laboratory, Fargo, N.Dak.; Gulf Coast Mosquito Research Laboratory, Lake Charles, La.; U.S. Livestock Insects Laboratory, Kerrville, Tex.; Lone Star Tick Laboratory, Poteau, Okla.; Cattle Fever Tick Research Laboratory, Falcon Heights, Tex.; Mayaguez Institute for Tropical Agriculture, Mayaguez, Puerto Rico.

Post Harvest Technology Facilities

Fruit and Vegetable Post Harvest Research Facilities--Post harvest research is conducted at 11 locations throughout the United States where horticultural crops are produced. The laboratories conduct research programs on quality maintenance and loss reduction of horticultural crops and are located to provide direct access to growers and shippers. To accomplish their mission, the laboratories study the effects of the preharvest environment unique to the growing area; effects of post harvest treatments for controlling pathological and physiological diseases; storage design, specifications, and environments; improved handling, packaging, and transporting methods; and chemistry and biochemistry of horticultural crops.

Potato Handling Research Center, Orono, Maine; Fruit and Vegetable Harvesting Research, East Lansing, Mich.; Red River Valley Potato Research Laboratory, East Grand Forks, Minn.; Market Quality and Handling Research, Raleigh, N.C.; Handling and Facilities Research, Gainesville, Fla.; U.S. Horticultural Research Laboratory, Orlando, Fla.; Subtropical Horticultural Research Station, Miami, Fla.; Subtropical Fruit and Vegetable Research, Weslaco, Tex.; Market Quality and Transportation Research Laboratory, Fresno, Calif.; Production, Harvesting, and Handling of Tree Fruits Research, Wenatchee, Wash.; Commodity Treatment, Handling, and Distribution Research, Hilo, Hawaii.

Fruit and Vegetable Processing Research Facilities--Six research laboratories are situated in areas where horticultural crops are grown and the processing industry is located. These locations all conduct interdisciplinary research addressed to quality, safety, and optimum utilization of specific horticultural crops. At each location, research is coordinated with university, private, or other Federal research efforts relating to genetics, production, environment, and harvesting.

The research thrusts of the laboratories are energy conservation, waste reduction, and processing efficiency. Information is also developed for specifications and standards for raw and finished products. Problems addressed relate to fermentation, preservation of cucumbers and other vegetables, potato storage for assuring optimum quality for processing, and processing citrus and subtropical fruits and vegetables. At Hilo, an interdisciplinary team conducts research on quarantine treatments for Hawaiian fruit, quality maintenance of the fresh produce in distribution, and processing of surplus commodities. Food Crop Utilization Laboratory, Weslaco, Tex.; Commodity Treatment, Handling and Distribution Research, Hilo, Hawaii; Fruit and Vegetable Chemistry Laboratory, Pasadena, Calif.; Citrus and Subtropical Products Laboratory, Winter Haven, Fla.; Food Sciences Laboratory, Raleigh, N.C.; and East Grand Forks, Minn.

Post Harvest Insect Control Laboratories--Ten laboratories are distributed throughout the United States in such a way that Federal scientists concerned with insect pests in stored commodities have access to the entire marketing system from farm production to commercial storage, terminal export elevators, shipment and transportation, storage, milling, packaging, and overseas sales. These laboratories are equipped with chambers that can be used in commodity treatment studies involving both vacuum and atmospheric test conditions. This equipment is generally not available anywhere else in the United States or in the world.

Facilities at the laboratories permit investigations to proceed from basic studies to studies on a large enough scale so that practical problems with new techniques of control can be identified. The laboratories assemble scientific disciplines with sufficient critical mass to facilitate interdisciplinary research. U.S. Grain Marketing Research Laboratory, Manhattan, Kans.; Stored Product Insect Research Laboratory, Fresno, Calif.; Hawaiian Agricultural Experiment Station, Hilo, Hawaii; SEA Fruit Flies Laboratory, Honolulu, Hawaii; Stored Product Insects Research and Development Laboratory, Savannah, Ga.; Tobacco Storage Insects Research Unit, Richmond, Va.; Insect Attractants, Behavior, and Basic Biology Research Laboratory, Gainesville, Fla.; Stored Products and Household Insects Laboratory, Madison, Wis.; Rice Experiment Station, Beaumont, Tex.; Subtropical Horticulture Research Station, Miami, Fla.

Market Quality Research Facilities--These laboratories are located near large U.S. terminal markets and at the largest European terminal market. Research conducted at these laboratories is unique; it is not duplicated by any State or Federal facility in this country or elsewhere throughout the world. Research at these facilities seeks, through the scientific process, to expand domestic and foreign markets and help U.S. farmers contribute to more efficient marketing by reducing distribution costs for the products of American farms and to deliver a better quality product, through reduced spoilage and damage, to consumers.

Research is concerned with the identification and resolution of market quality problems, mainly in horticultural crops, that will reduce handling, costs, and market losses of U.S. farm products. The European laboratory provides technical marketing information to U.S. exporters and other agricultural researchers on the quality acceptance standards and the handling and transporting methods used in the European markets. Data collected on the arrival condition of test shipments originated by cooperating research scientists in producing areas form an important research element of the laboratories, eventually leading to recommendations for reducing costs and improving the condition of arriving commodities. Eastern Market

Pathology Laboratory, New Brunswick, N.J.; Market Pathology Laboratory, Chicago, Ill.; European Marketing Research Center, Rotterdam, The Netherlands.

Cotton Quality and Processing Laboratories--These laboratories represent a research resource not found anywhere else in the world. The specialized facilities and scientific staffs of the laboratories not only provide a valuable national resource for agriculture, but also support a major segment of the domestic textile industry and a sizable export market. Although all three ginning laboratories perform similar functions, each is essential to addressing the special genetic, growing, and harvesting problems pertaining to the three distinct cotton-growing regions of the United States--the humid, rainy areas of the Southeast and Mississippi Delta; the arid, high plains areas of Texas; and the hot, dry, irrigated areas of the Southwest and West.

Buildings and facilities are specially designed to handle, dry, and gin the seed cottons produced in these three separate regions of the Cotton Belt. The Cotton Quality Research Station at Clemson evaluates the effects of proposed changes in the production/ginning sequence on processing quality of cotton. The Cotton Quality Laboratory at Knoxville is a central laboratory having instrumentation for evaluating small research samples of fiber and seed for cooperating SEA/AR scientists at approximately 10 locations across the Cotton Belt. In addition, the laboratory provides analyses for the National Cotton Variety Testing Program which is a joint SEA/AR-SAES project. Research at this laboratory will be moved to the Southern Regional Research Center at New Orleans in 1980 to better coordinate activities with related ongoing research at the latter location. Together with the ginning laboratories, the quality laboratories provide an essential research support service to the Cotton Division of USDA's Agricultural Marketing Service (AMS), which by law is responsible for grading and classing the American cotton crop each year. Southern Plains Cotton Research Laboratory, Lubbock, Tex.; Southwestern Cotton Ginning Research Laboratory, Mesilla Park, N. Mex.; U.S. Cotton Ginning Laboratory, Stoneville, Miss.; Cotton Quality Research Station, Clemson, S.C.; Cotton Quality Laboratory, Knoxville, Tenn.

National Peanut Research Laboratory--This laboratory, located in the heart of the Southeastern peanut production area, deals with problems associated with the quality and safety of peanuts. A multidisciplinary team consisting of the essential scientific and engineering expertise needed to address problems in shelling, handling, grading, and storing of peanuts provides a unique link between the farmer, small processor, and the food industry, both here and abroad. Dawson, Ga.

U.S. Grain Marketing Research Laboratory--This laboratory provides the facilities, equipment, and "critical mass" of scientific and engineering expertise needed to address the full range of basic and applied research problems associated with maintenance of quality, reduction of losses, and safety in the handling and storage of grain. These capabilities are also used to resolve problems of the action and regulatory agencies, particularly USDA's Federal Grain Inspection Service (FGIS). This national facility complements the research capability of the milling school at Kansas State University and the American Institute of Baking, all located at Manhattan, which together provide an unparalleled capability to resolve problems associated with our major agricultural commodities. Manhattan, Kans.

Facilities for Research on Metabolism and Toxicology of Agricultural Chemicals and Naturally Occurring Toxicants--SEA/AR programs constitute most of the Nation's research effort in this highly visible and increasingly important area. The required sophisticated equipment and facilities that could not be justified by smaller and less comprehensive units are concentrated in these facilities.

Specific objectives of the research are to (1) determine the metabolic fate of pesticides, agricultural chemicals, and drugs used to prevent and control diseases or to improve efficiency of animal production; (2) define chemical characteristics and modes of action and develop measures for preventing losses from poisonous

plants and other naturally occurring toxicants; and (3) conduct toxicological and nutritional studies related to food and feed safety in production processing and distribution. Results are used by action/regulatory agencies in programs to ensure safety of animal products for consumers and to reduce the costs of production for producers. Beltsville Agricultural Research Center, Beltsville, Md.; Western Regional Research Center, Albany, Calif.; Russell Research Center, Athens, Ga.; Metabolism and Radiation Research Laboratory, Fargo, N. Dak.; Veterinary Toxicology and Entomology Laboratory, College Station, Tex.; and Poisonous Plant Research Laboratory, Logan, Utah.

Family and Rural Development Facilities

Family Resource Development Facilities--The Family Economics Research Group scientists conduct research on the economic problems of families and the improved use of time, money, energy, and other resources by families. This group of scientists is located at Hyattsville and has direct access to national data collections and direct personal contact with national program leaders. This contact expedites transfer and use of study results as guidance for developing programs directed to an improved level of family living.

Physical scientists at the SEA/AR Textiles and Clothing Laboratory conduct basic and applied research on the most effective use and care of textiles, clothing, and home furnishings available to consumers. The scientists disseminate research results in technical and popular publications. The laboratory shares a conditioning room with the Department of Textile and Clothing at the University of Tennessee and, in addition to its own highly specialized textile-testing equipment, has access to a variety of sophisticated equipment and instrumentation on the university campus. Consumer and Food Economics Institute, Hyattsville, Md.; Textiles and Clothing Laboratory, Knoxville, Tenn.

Rural Housing Research--SEA/AR research of the Rural Housing Research Unit (RHRU) has developed needed technology for the design and construction of improved rural housing, including the special housing needs of low-income families, migrant workers, and the elderly. Recent accomplishments include two major breakthroughs in the development of economical solar heating and cooling systems, including a solar attic heating and cooling system and a simple, low-cost, site-built, flat-plate air collector. Prototype test houses for onsite evaluation and demonstration have been built in six States.

All the research activities of the RHRU support housing and community facilities programs of USDA's Farmer's Home Administration (FmHA). RHRU also cooperates with Tuskegee Institute in evaluating an innovative, community-type, reduced-cost sewage disposal system in Alabama, and it actively participates in the cooperative Regional Project S-141 (formerly S-95), "Quality Housing Environment for Low-Income Families." Rural Housing Research Unit, Clemson, S.C.

PRINCIPAL STATUTES RELATING TO AGRICULTURAL RESEARCH ACTIVITIES

Prepared by Legislative Staff, Office of Director
Science and Education Administration

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Agricultural Act of 1949 as amended	88-297	4/11/64	Authorizes Secretary to conduct a special cotton research program designed to reduce the cost of producing upland cotton in the United States (<u>78 Stat. 174</u>) (<u>7 U.S.C. 14</u>)
Agricultural Trade Development and Assistance Act	83-480	7/10/54	Authorizes the sale of agriculture commodities to friendly countries; authorizes the use of foreign currencies accruing from such sales for a variety of research activities. Sec. 104(b)(1) provides that foreign currency receipts may be used for the purpose of developing new markets for U.S. agricultural commodities. Sec. 104 (b)(2) provides that foreign currency receipts may be used to collect and disseminate scientific and technological information, and conduct research and support scientific activities overseas. This includes programs of scientific cooperation between the U.S. and other countries, such as coordinated research against diseases common to all mankind or unique to individual regions. Sec. 104(b)(3) also authorizes support for programs of medical and scientific research, cultural and educational development, family planning, health, nutrition and sanitation. (<u>68 Stat. 454</u>) (<u>7 U.S.C. 1691</u>)
Arboretum	69-799	5/4/27	Authorizes Secretary to establish a national arboretum for purposes of research and education concerning tree and plant life. (<u>44 Stat. 1422</u>) (<u>20 U.S.C. 191-194</u>)
Cattle Grubs	80-651	6/16/48	Authorizes Secretary to increase and intensify research and investigations into problems and methods relating to the eradication of cattle grubs. (<u>62 Stat. 458</u>) (<u>21 U.S.C. 114c</u>)

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Commodity Credit Corporation Charter Act	80-806	6/29/48	Authorizes research relating to the conservation or disposal of commodities owned or controlled by the corporation in collaboration with research agencies of the Department. (<u>7 U.S.C. 612c</u>)
Cooperative Research Projects	88-250	12/30/63	Authorizes ARS Administrator to enter into agreements and receive funds from State or other political subdivisions, organizations or individuals. (<u>77 Stat. 820</u>) (<u>7 U.S.C. 450a</u>)
Cotton	---	4/12/28	Authorizes Secretaries of Agriculture and Commerce to engage in technical and scientific research on American-grown cotton and its byproducts. (<u>45 Stat. 426</u>) (<u>7 U.S.C. 423</u>)
Cotton Ginning	71-160	4/19/30	Authorizes Secretary to investigate ginning of cotton, to establish and maintain experimental ginning plants and laboratories and make tests and technical and scientific studies with respect thereto. (<u>46 Stat. 24</u>) (<u>7 U.S.C. 424</u>)
Dairy Industry	68-156	5/29/24	Authorizes investigations of the dairy industry and dissemination of information for promotion of the dairy industry. (<u>43 Stat. 243</u>) (<u>7 U.S.C. 402</u>)
Dairy Industry	---	5/29/28	Authorizes Secretary to establish a dairying station at Lewisburg, Tennessee, for investigations, experiments and demonstrations in the dairy industry, and the problems pertaining thereto in the South. (<u>45 Stat. 981</u>) (<u>7 U.S.C. 422</u>)
Dairy and Livestock Industry	69-490	7/3/26	Authorizes Secretary to establish a dairying and livestock experiment station at Mandan, North Dakota, for investigations, and experiments in the dairy and livestock industries and problems pertaining to establishment and development thereof. (<u>44 Stat. 840</u>) (<u>7 U.S.C. 421</u>)
Domestic Animals and Poultry	---	5/29/48	Establishes Bureau of Animal Industry to investigate and report on the condition of domestic animals and live poultry in the U.S., and on the causes and means of prevention of diseases among them. (<u>23 Stat. 31</u>) (<u>7 U.S.C. 391</u>)

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Foot and Mouth Research	80-496	4/28/48	Authorizes Secretary to establish research laboratories and conduct and contract for research of foot-and-mouth and other animal diseases. (<u>62 Stat. 198</u>) (<u>21 U.S.C. 113a</u>)
Horse Breeding	80-494	4/21/48	Authorizes Secretary, in connection with transfer of any remount service to Department, to improve breeding of horses suited to the United States. (<u>62 Stat. 197</u>) (<u>7 U.S.C. 437</u>)
Housing Act of 1949	87-70	8/30/61	Authorizes Secretary to conduct research on the adequacy of existing farm housing, current and prospective needs for farm housing, interrelation of farm housing problems with those of urban and suburban areas, and other matters bearing on the provision of adequate farm housing. (<u>75 Stat. 188</u>) (<u>42 U.S.C. 1476b</u>)
Humane Slaughter Research	85-765	9/27/58	Authorizes Secretary to conduct, assist, and foster research, investigations, and experimentation to develop and determine methods of slaughter and the handling of livestock in connection with slaughter, which are humane. (<u>72 Stat. 863</u>) (<u>7 U.S.C. 1904</u>)
Organic Act of 1862	None	5/15/1862	The Organic Act of 1862, in addition to establishing the Department of Agriculture charged the Commissioner of Agriculture with the Duty "...To acquire and preserve in his Department all information concerning agriculture which he can obtain by means of books and correspondence, and by practical and scientific experiments,..." This Act initially authorized the Department of Agriculture to perform a research function in relation to agricultural matters. (<u>12 Stat. 387</u>) (<u>7 U.S.C. 2201, 2204</u>)
Poultry Improvement	78-425	9/21/44	Authorizes Secretary to cooperate with State authorities in the administration of regulations for the improvement of poultry, poultry products, and hatcheries. (<u>58 Stat. 734</u>) (<u>7 U.S.C. 429</u>)

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Regional Research Laboratories	75-430	2/16/38	Authorizes Secretary to establish four laboratories, one in each major farm producing area, to conduct researches into and to develop new scientific, chemical, and technical uses and new and extended market for farm commodities and products and byproducts thereof. <u>(52 Stat. 37)</u> <u>(7 U.S.C. 1292)</u>
Research and Marketing Act of 1946	79-733	8/14/46	Authorizes Secretary to conduct research into basic laws and principles relating to agriculture; to improve and facilitate the marketing and distribution of agricultural products; to improve the quality of, and the development of new and improved methods of the production, marketing, distribution, processing, and utilization of plant and animal commodities at all stages from the original producer to the ultimate consumer; to conduct research in the areas of human nutrition, development of new use and markets for agricultural commodities and agricultural resources (manpower, soil, plants, animals, and equipment); to conduct research relating to conservation development, and the use of land, forest, and water resources; authorizes the Secretary of Agriculture to enter into contracts with public or private organizations or individuals when in his judgment the research can be carried out more effectively, more rapidly or at less cost than if performed by Department personnel. <u>(60 Stat. 1082)</u> <u>(7 U.S.C. 427, 1621)</u>
Research Grants- Basic	85-934	9/6/58	Authorizes federal agencies to make grants for basic scientific research at nonprofit institutions of higher education or nonprofit organizations whose primary purpose is the conduct of scientific research. <u>(72 Stat. 1793)</u> <u>(42 U.S.C. 1891)</u>

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Research Grants- Special	89-106	8/4/65	Authorizes Secretary to make grants to State Agricultural Experiment Stations, colleges, universities, and other research institutions and organizations and to the Federal and private organizations and individuals for basic and applied research to further the programs of the Department. (<u>79 Stat. 431</u>) (<u>7 U.S.C. 4501</u>)
Soil Conservation Act	74-46	4/27/35	Authorizes Secretary to conduct surveys, investigations and research relating to the character of soil erosion and the preventive measures needed, and economic use and conservation of land. (<u>49 Stat. 163</u>) (<u>16 U.S.C. 590a</u>)
Substitutes for Strategic Materials	79-520	7/23/46	Authorizes Secretary to make scientific technologic and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or for using agricultural commodities for the manufacture of any material determined to be strategic and critical or substitutes therefor. (<u>60 Stat. 599</u>) (<u>50 U.S.C. 98f</u>)
Tropical Research	89-808	11/11/66	Authorizes Secretary to conduct research in tropical and subtropical agriculture for the improvement and development of tropical and subtropical food products for dissemination and cultivation in friendly countries. (<u>80 Stat. 1537</u>) (<u>7 U.S.C. 1736(a) (4)</u>)
Virgin Islands	82-228	10/29/51	Authorizes Secretary to establish in the Virgin Islands of the United States an agricultural research and extension service program. (<u>65 Stat. 661</u>) (<u>48 U.S.C. 1409</u>)

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Federal Water Pollution Control Act	92-500	10/18/72	Authorizes the Administrator of EPA, in cooperation with other Federal agencies, to develop comprehensive programs for water pollution control, and in establishing National Programs therefor, to cooperate with other Federal agencies in the conduct of research, investigations, training, and information, including, among other things, a comprehensive study and research program for preventing, reducing and eliminating pollution from agriculture. Authorizes the Administrator of EPA, in consultation with the Secretary of Agriculture to make grants for research and dissemination of information with respect to methods of preventing and eliminating pollution from agriculture.
Agriculture and Consumer Protection Act of 1973 (Farm Bill)	93-86 (Sec 810)	8/10/73	The Secretary is authorized and directed to carry out regional and national research programs, in order to reduce fertilizer and herbicide usage in excess of production needs, to develop wheat and feed grain varieties more susceptible to complete fertilizer utilization, to improve the resistance of wheat and feed grain plants to disease and to enhance their conservation and environmental qualities.
Agriculture and Consumer Protection Act of 1973 (Farm Bill)	93-86 (Sec 611)	8/10/73	The Secretary is authorized and directed to carry out programs to destroy and eliminate cotton boll weevils in infested areas of the United States as provided herein and to carry out similar programs with respect to pink bollworms or any other major cotton insect if he determines that methods and systems have been developed to the point that success in eradication of such insects is assured. The Secretary shall carry out the eradication programs authorized this subsection through the Commodity Credit Corporation, carrying out insect eradication projects, he shall utilize the technical and related services appropriate Federal, State, private agencies, and cotton organizations.

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Agriculture and Consumer Protection Act of 1973 (Farm Bill)	93-86	8/10/73	The Secretary of Agriculture is authorized and directed to carry out a comprehensive study and investigation to determine the reasons for the extensive loss of livestock sustained each year, through injury and disease while such livestock is being transported in interstate commerce for commercial purposes. The Secretary is also authorized and directed to conduct, in connection with such study and investigation, an intensive research program for the purpose of developing measures that can be taken to reduce materially the number of animals lost, through injury and disease during transportation for commercial purposes. (This authority terminates after 4 years.)
National Arboretum	94-129	11/13/75	To authorize the Secretary of Agriculture to accept, receive, hold, utilize, and administer on behalf of the United States gift bequests, or devises of real and personal property made for the benefit of the National Arboretum.
International Development and Food Assistance Act of 1975	94-161 Title II Sec 214	12/20/75	Transfers Farmer-to-Farmer Program from the Secretary of Agriculture to the President.

ADDITIONAL PRINCIPAL STATUTES RELATING TO AGRICULTURAL RESEARCH
ACTIVITIES OF THE USDA SCIENCE AND EDUCATION ADMINISTRATION--AGRICULTURAL RESEARCH

(From the 95th and 96th Congresses through July 1980)

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Food and Agriculture Act of 1977 (Farm Bill)	95-113 (Title 14)	9/29/77	Assigns USDA the lead agency role with respect to national food and agricultural science. It further provides for coordination, expanded efforts in priority areas, and widening participation in research and education beyond the USDA and Land Grant University system. The law provides for expansion of USDA involvement in agricultural solar energy research, development and demonstration, and grants USDA authority to be a full participant in nutrition research and education and in international related food and agricultural research and education. Establishes several coordinating and policy committees within USDA. (91 Stat. 981) (7 U.S.C. 3101)
Food and Agriculture Act of 1977, amendment (Farm Bill)	95-547	10/28/78	Amends section 1445(b) of the Food and Agriculture Act of 1977 to modify the formula for distribution of funds authorized thereunder for agricultural research.
Surface Mining Control and Reclamation Act of 1977	95-87	8/3/77	Sets performance standards for environmental protection to be met at all major surface mining operations for coal; provides for joint responsibility and enforcement by the States and the Federal government; establishes a self-supporting Abandoned Mine Reclamation Fund to restore land ravaged by uncontrolled mining operations in the past; protects certain lands regarded as unsuitable for surface mining; establishes mining and mineral resource institutes, and provides funds for coal research laboratories and energy graduate fellowships and; provides for a transfer of funds to USDA for technical and financial assistance to landowners entering into long-term agreements for reclamation purposes.

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Surface Mining and Control and Reclamation 1977, amendments	95-343	8/11/78	Authorizes funds for FY 1979 and 1980 for surface mining control and reclamation.
Native Latex Commercialization and Economic Development Act of 1978	95-592	11/4/78	Authorizes the Secretaries of Agriculture and Commerce to coordi- nate basic and applied research, technology development and technology transfer leading to effective and economical methods for large-scale culturing of planations and the extraction of latex.
Gifts and Property Acceptance and Administration by Secretary of Agriculture	95-442	10/10/78	Authorizes the Secretary of Agriculture to accept and adminster on behalf of the United States gifts or devises of real and personal property for the benefit of the Department of Agriculture or any of its programs.
Carl Hayden Bee Research Center	95-446	10/10/78	Designated the United States Department of Agriculture's Bee Research Laboratory in Tucson, Arizona, as the "Carl Hayden Bee Research Center."
Roman Hruska Meat Animal Research Center, Nebraska Designation	95-436	10/10/78	Designated the Meat Animal Research Center located near Clay Center, Nebraska, as the "Roman L. Hruska Meat Animal Research Center."
Water Research and Development Act of 1978	95-467	10/17/78	Promotes a more adequate and responsive national program of water research and development.
W. R. "Bob" Poage Pecan Field Station, Texas	95-451	10/11/78	Designates the United States Department of Agriculture's Pecan Field Station in Brownwood, Texas, as the "W.R. 'Bob' Poage Pecan Field Station."
Soil and Water Resources Conservation Act of 1977	95-192	11/18/77	Provides that the Secretary shall appraise, on a continuing basis, the soil, water and related resources of the Nation; develop and periodically update a program for furthering the conservation, protection and enhance- ment of the soil, water and related resources of the Nation; and provides that the President shall transmit periodically to the Congress the appraisal and the program as required by this Act.

Subject or Popular Title	Public Law No.	Approved Date	Purpose
Clean Water Act of 1977	95-217	12/27/78	Exempts irrigation return flows from the permit system requirements of section 402 of the Federal Water Pollution Control Act of 1972 and defines then as nonpoint sources to be considered in areawide waste treatment management plans.
Public Lands Relinquishment of Jurisdiction	95-441	10/10/78	Authorized the Secretary of Agriculture to relinquish exclusive legislative jurisdiction over lands or interests under his control.
Humane Methods of Slaughter Act of 1978	95-445	10/10/78	Prohibited inhumane slaughtering of livestock within the United States and the importation of any meat or meat products unless such livestock are slaughtered in a humane manner.
Energy Security Act	96-294	6/30/80	<p>Authorizes funds to establish the production of synthetic fuels, gasohol, solar energy, renewable resources, geothermal energy, to establish an energy conservation program and energy supply targets, and to extend the Defense Production Act until September 30, 1986.</p> <p>Title II establishes a comprehensive biomass and alcohol fuels program and an urban waste program. Part A of this title contains new programs for USDA, including forestry.</p> <p>Title VII calls for 2 research programs: (1) Acid Precipitation and (2) Carbon Dioxide. The acid precipitation study sets up an interagency task force jointly chaired by NOAA, EPA, and USDA. The 10-year study includes identifying sources contributing to, monitoring levels of, and formulating recommendations to alleviate acid precipitation.</p>

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